THE ATOM

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THE ATOM

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COVER:

Plastic scintillators for energy conversion are one of the many products J-16's Earl Fullman makes for LASL use. "Banished" to the safer environs of old Anchor Bunker 15 years ago, Earl will soon move into the new J division building. Story begins on page 11.

W. H. Langham Receives DOD Medal

The U.S. Defense Department's "Distinguished Public Service Medal" and an accompanying citation signed by Defense Secretary Robert S. McNamara have been presented to Wright H. Langham, assistant health division leader for biomedical research.

The award was presented to Langham Aug. 8 by Lt. Gen. H. C. Donnelly, USAF, director of the Defense Atomic Support Agency (DASA), who made the presentation on behalf of McNamara.

The medal was in recognition of Dr. Langham's work in connection with the Palomares, Spain, accident in early 1966.

The citation reads:

"For exceptionally meritorious civilian service to the United States while serving with the Department of Defense during the period 23-29 January, 1966, and the subsequent period of cooperation between the United States and Spain from 11 February to 15 March, 1966.

"During these periods, Dr. Langham provided invaluable assistance to the government of the United States and Spain in the areas of plutonium hazard evaluation and decontamination criteria. In this capacity, he demonstrated exceptional scientific knowledge and skill, outstanding ability to communicate, devotion to humanity and dedication to his country.

"Dr. Langham's outstanding and unselfish performance during this period, while under severe working conditions and at considerable personal hardship, contributed greatly to the exceptionally successful completion of negotiations following the Palomares accident and reflects great credit upon himself, the Department of Defense and the Nation."

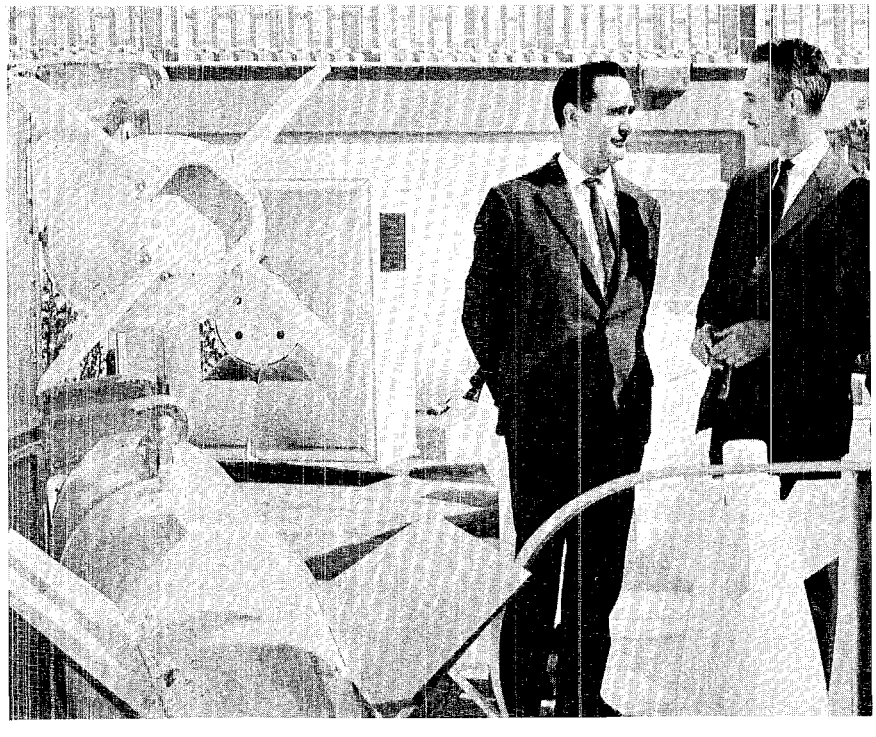
The Palomares accident occurred on Jan. 17, 1966, when a KC-135 tanker and a loaded B-52 bomber exploded in mid-air during a refueling operation. Two hydrogen bombs fell undamaged--one on land, one in the Mediterranean--but the chemical explosive components of two others had dropped on land and exploded on impact, scattering plutonium and uranium.

Langham is regarded as a pioneer in the field of the toxicology of plutonium. He is internationally recognized as a leader in virtually every phase of radiobiology and has become one of the nation's leading authorities on the effects of fallout from nuclear weapons.

He has been deeply concerned with the health hazards of plutonium since the first microscopic amounts of it arrived at Los Alamos in the spring of 1944. Originally a plutonium chemist, he was one of four who began a research program aimed at developing tests for determining exposure of laboratory personnel and a few months later supervised development of the first successful method for analyzing urine for plutonium.

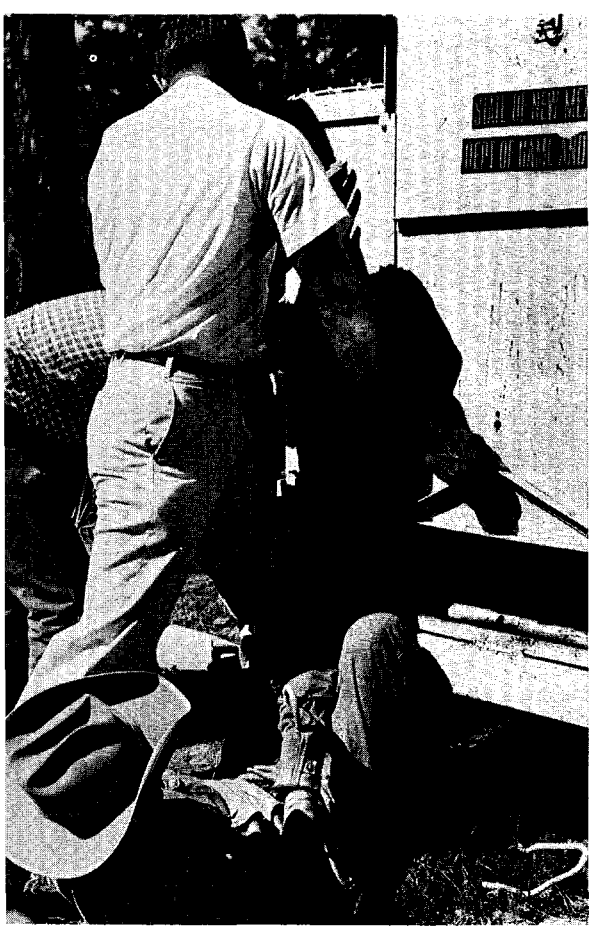
Langham received his Ph.D. in biochemistry from the University of Colorado in 1943, was a research chemist at the Metallurgical Laboratory of the University of Chicago in 1943-44 and came to LASL in 1944.

Other LASL personnel who have received the Distinguished Public Service Medal while employed at the Laboratory include Director Dr. Norris E. Bradbury, Dr. William E. Ogle and the late Dr. Alvin C. Graves.



Langham escorted Emilio Iranzo, left, a staff member of the Division of Health and Protection of Spain's Junta de Energia Nuclear, through the LASL Museum during a visit by Dr. Iranzo to the United States early last year.

ABOVE: Black bear trapped on 35th St. was weighed on Zia scales. ABOVE RIGHT: Homer Pickens clamps red tag on bear's ear. BELOW: Bud Wingfield, on ground, holds caged bear with rope, Milt Bailey steadies cage while Dr. Marty Holland administers tranquilizer.



Black Bear Trapped In North Community

There are bears in the Jemez Hills—and in Los Alamos.

Dry spring weather brought the black bruins down from more remote climes of the Jemez country onto the Pajarito Plateau.

Atomic Energy Commission Conservation Officer Homer Pickens said the lure of garbage in cans at homes in the forested areas of the city is great, and the bears' natural aversion to humans has been overcome by their hunger. Already, two have been trapped within the city limits in the northern part of town.

But rains of the past few weeks have brought out the berries, so the bears should soon move back to their regular haunts away from civilization, said Pickens.

Until they do, however, people should leave them alone. Even though a bear is normally quite shy, he becomes a real bear if cornered in a yard, or if some brave individual tries to play with him. Mother bears with cubs are especially dangerous.

One of the two bears trapped within recent weeks was taken by Pickens into the Guaje Canyon area for release. Before freeing young bruin, Pickens and Marty Holland, veterinarian with LASL's H division, anesthetized him—in the cage trap, of course. With the aid of Milt Bailey and Bud Wingfield, they were able to place a red plastic tag in the bear's ear and to spray him with irridescent orange paint.

"We want to tag these animals, not destroy them," Pickens said. "In this way we can add to our knowledge of their habits."

The young male was trapped behind the home of John Steely, 2522 B 35th St. He had come down off the golf course into Steely's back yard and other back yards along the street several times. Pickens set up the cage trap just outside the Steelys' yard, and the bear was caught in it July 23.

Pickens said the animal weighed 301 pounds. He is classed as a black bear, but is actually brown in color. About five to six years old, the animal showed no enmity toward humans, but is tremendously strong.

"So, if you spot an orange-colored bear, look, but don't chase," said Homer.

Land has been cleared and excavations are well under way for the new meson facility on Mesita de los Alamos, situated between East Road (upper left) and East Jemez Road (right). Trench for beam channel runs along the length of the mesa. Aerial photo facing east also shows east gate tower and Black Mesa in extreme upper left.

Excavations Begin For Meson Facility

By Bob Brashear

story on next page

MP division personnel recently toured Mesita de los Alamos to see progress of construction on the new meson facility.

Part of road to meson facility is new and part, above, follows old trail which, until recently, was navigable only by four-wheel-drive vehicles. Road is closed to all traffic now, while construction is under way.

Men and machines are pushing 300,000 cubic yards of dirt around on top of Mesita de Los Alamos so Los Alamos scientists can push protons in a straight line at 156,478 miles per second.

Preparation of the site for LASL's proposed meson accelerator facility has been started with a half-million-dollar contract to do the preliminary digging for the buildings. Burn Construction Co. of Las Cruces is the contractor. When the work is complete, according to Fred Tesche, associate MP division leader, gas and water lines will be completed into the site, and the access road will be finished. Tesche said the site is closed to visitors because the road is not complete and there is considerable movement of heavy equipment back and forth across the area at this time.

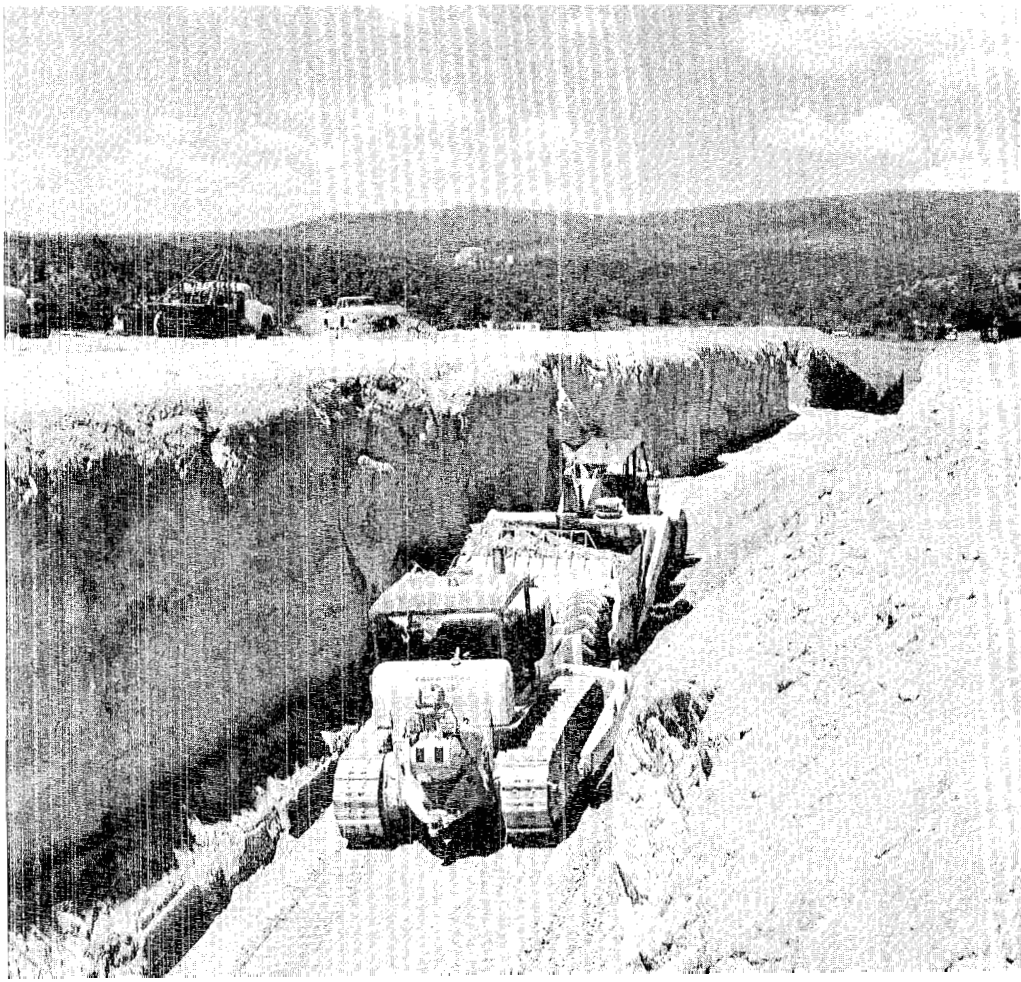
The site resembles two large helicopter pads connected by a deep trench and surrounded with rocks

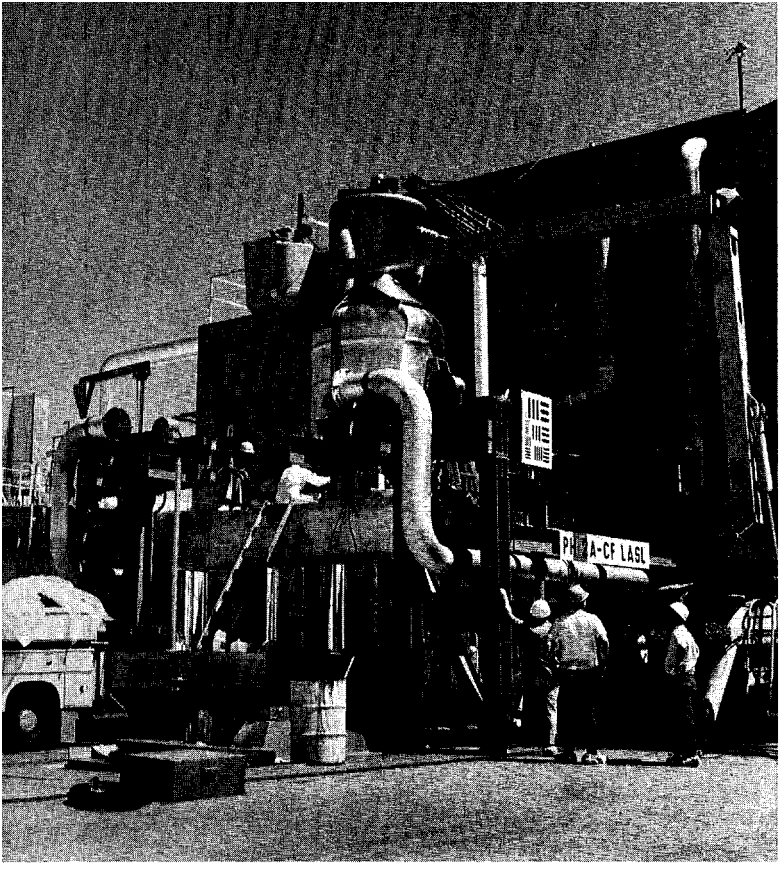
Injector facility and offices will be built at western end of mesa (right foreground) with target area at eastern end.

Heavy equipment cuts deep swath into surface of mesa where beam of protons will be "shot" through concrete tunnel at nearly 160,000 miles per second at target a half-mile away.

and vegetation typical of the finger mesas forming the Pajarito Plateau.

The westerly "pad" will actually be used to house the injector facility where positively charged particles—protons—will be pushed into a wave-guide channel resembling a space age gun barrel 2,600 feet long. The wave guide "barrel" will occupy the trench in a 12-by-12-foot concrete tunnel 25 feet below the surface of the mesa. The eastern part will be occupied by the target area with accompanying rooms for experimental equipment. The protons, pushed to around 84 per cent the speed of light, will enter the target room where they will be used as probes to poke into atomic nuclei or utilized to produce—with appropriate targets—mesons, the sub-nuclear size particles in numbers great enough that LASL scientists can use them as probes to get even deeper into atomic nuclei.





Technicians swarm over Phoebus 2 making last minute adjustments before cold flow series begins.

Phoebus 2—the most powerful nuclear rocket reactor in the Rover program—has successfully taken its first step on the road to a flyable engine capable of manned interplanetary flight.

The Los Alamos Scientific Laboratory-designed-and-developed reactor completed its "cold flow" test series at the Nuclear Rocket Development Station at Jackass Flats, Nev., last month.

In a "cold flow" test, experiments are conducted using an assembly identical to the design used in "hot" tests except that the assembly does not contain any fissionable material nor produce a nuclear reaction. No fission power was, therefore, generated in the reactor core of Phoebus 2 during the test.

The purposes of "cold flow" tests include checking the reactor design under gas-flow conditions and at liquid hydrogen temperatures, measuring variations in pressure, temperatures and flow rates during simulated start-up operations and obtaining initial experience on the hookup and test operations of Phoebus 2 reactors in the test facility.

The reactor system and test facility operated as planned, and the test results provide the basis for proceeding with a full-power test of the Phoebus 2 reactor—expected in late 1967 or early 1968.

This first in a family of higher-powered nuclear rocket reactors is designed to have an ultimate power level of approximately 5,000 megawatts. As such, it will provide basic design and performance data for reactors to be used in the high thrust NERVA engine, capable of delivering 200,000 to 250,000 pounds of thrust.

Construction of NERVA (Nuclear Engine for Rocket Vehicle Application), a flight engine based on the technology of LASL's reactors, is being undertaken by Aerojet-General Corp. and by Westinghouse Electric Corp.

The design of the Phoebus 2 reactor is similar to previous reactors tested at 1,000 to 1,500 megawatts in the nuclear rocket program, but is larger in diameter to provide for the higher power rate.

The last full-power test of a LASL reactor was on Feb. 23, 1967, when Phoebus 1B was operated for a total of 30 minutes, the maximum time planned, at design power of approximately 1,500 megawatts. The Phoebus series of nuclear reactors is primarily intended to provide advanced technology for solid-core graphite rocket reactors.

The nuclear rocket reactors are characterized by very large power levels and short operating times. An accumulated "run" time of 30 minutes—composed of segments of a few seconds' or minutes' duration —is considered sufficient. The reactor in the NERVA engine will not be required to operate continously, but rather in "spurts." Thus, the capability to start, stop and restart is a necessity. Another LASL reactor, Kiwi-B4-E, demon-

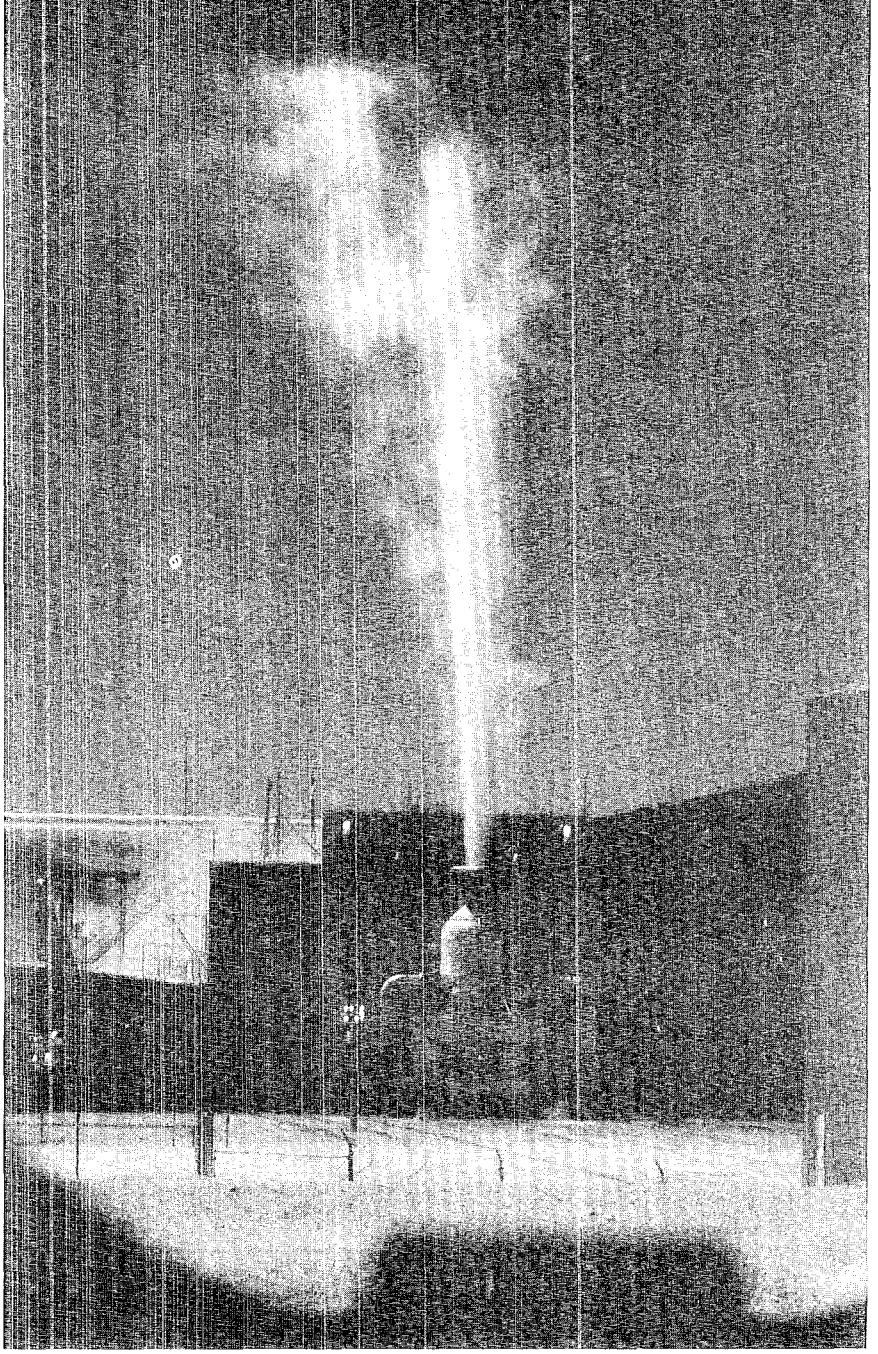
Phoebus 2 Undergoes 'Cold Flow'

strated in 1964 that this is possible.

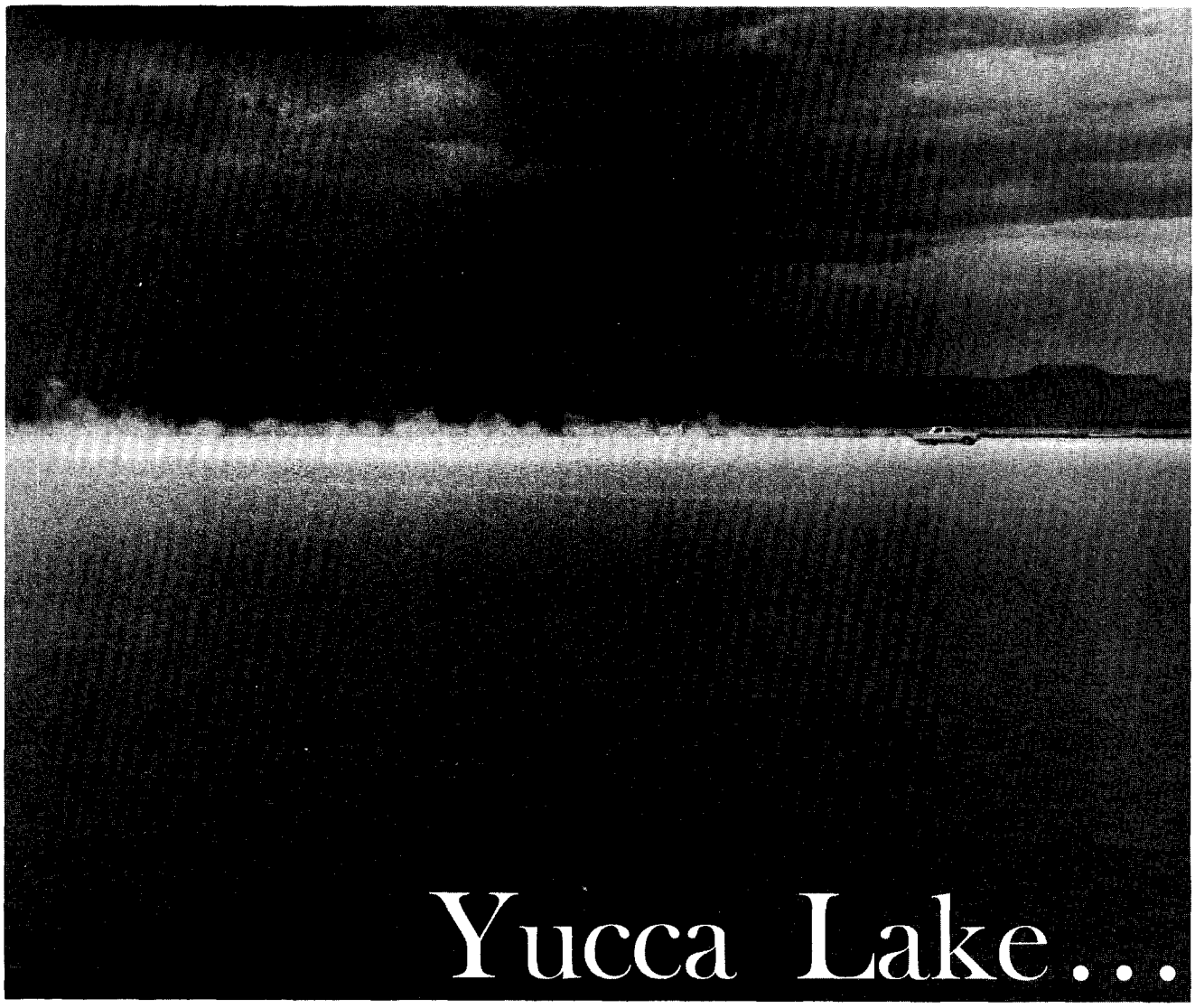
Although the designed power level of Phoebus 2 will produce a thrust much less than that of the largest chemical rockets, which reach about 1.5 million pounds, this is not an all-important factor. The nuclear rocket engine will not be used to lift the vehicle from the launch pad, for which chemical engines can be utilized, but rather will be used in outer space where the high exhaust velocity of the nuclear rocket is a great asset.

Project Rover—America's program to develop a nuclear propelled rocket—began only 12 years ago. The first reactor, LASL's Kiwi A, underwent a full-power run only eight years ago. Today, a LASL reactor expected to be very close to the prototype nuclear reactor which will be incorporated in the NERVA engine, has been designed, developed and completed successfully its first series of tests.

Manned deep space missions using nuclear rockets are coming closer to reality.



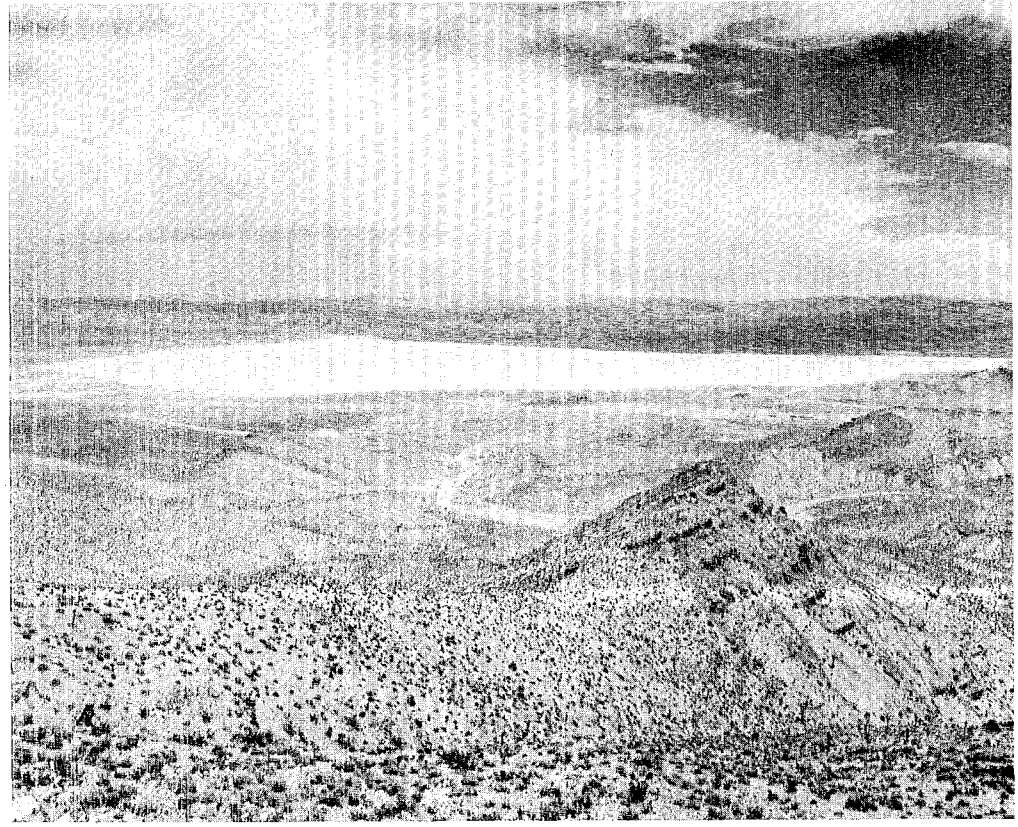
Infrared film gives moonlight effect to mid-day cold flow test, but contrasts plume against sky. Reactor has coating of frost from liquid hydrogen. Phoebus 2 is the highest-powered nuclear rocket reactor to date.



Yucca Lake... Dry—But Not Deserted

By BILL RICHMOND

LEFT: A speeding car, taking a short-cut across the lake bed followed by a trail of dust, appears to be outracing a rain storm. On this occasion the storm came right up to the edge of the lake bed before veering away. RIGHT: The vastness of Yucca Lake is evident from a mountain top nearby. The CP-1 area lies near right center with "News Knob" in the center.



YUCCA LAKE . . . a name that evokes in the minds of some people an image of still, blue water, fish, trees and grass—all normally associated with the word "lake." In the minds of others, particularly those who work at or visit the Nevada Test Site, the name Yucca Lake conjures up a mental picture of a dry, desolate, barren wasteland.

Actually, both impressions are wrong.

There are no fish in Yucca Lake now, although once there probably were, but it is far from being barren. History is recorded along the edges and in the middle of this dry lake called Yucca.

Yucca Lake is situated near the eastern edge of the test site and on the southern edge of Yucca Flats near CP-1—the control point from which underground testing in Yucca Flats is conducted. The lake is roughly triangular-shaped with vital statistics of 10-3924-109-minus 5-fine-silt-and-clay. In other words, the lake bed encompasses about 10 square miles in area, is 3,924-feet above sea level, has a maximum recorded temperature of 109°, a minimum of minus 5°, and is composed of fine silt and clay.

Man lived on and around the test site thousands of years ago, and during this period Yucca Lake was probably a true lake. However, little is known about this period in time. More is known about the later Paiute Indians who lived in the area hundreds of years ago and undoubtedly camped near Yucca Lake. Small bands of these Indians wandered throughout the area—probably on hunting and food foraging trips -- and set up camp on the edges of the lake which contained a good water supply at times.

Even today, Indian artifacts can be found on the edge of the lake bed. These include arrowheads, pottery chips, scrapers, small bits of charcoal and other relics of earlier days.

The first white explorer in the NTS area is believed to have been Escalante, a Franciscan missionary, who was in charge of the pueblo missions in New Mexico. In 1776 he led an expedition from Santa Fe which hoped to establish overland communications with Monterey in Alta, Calif. The expedition failed when it could not cross the Sierra Nevada range because of snow.

Although there is no evidence to substantiate it, there is a good possibility that Escalante was the first white man to view Yucca Lake—perhaps in the same year in which the Declaration of Independence was signed.

For the next 160 years or so, visitors to Yucca Lake included prospectors looking for gold; their mules and—as today—rattlesnakes.

During World War II, what is now NTS was part of the Las Vegas Bombing and Gunnery Range and was used by military pilots for strafing and bombing practice. Evidence of this use is still visible on the bed of Yucca Lake—especially after a good rain.

Targets for strafing were apparently located on the lake bed because spent cartridge casings, slugs, clips—and occasionally an unfired round—for .30

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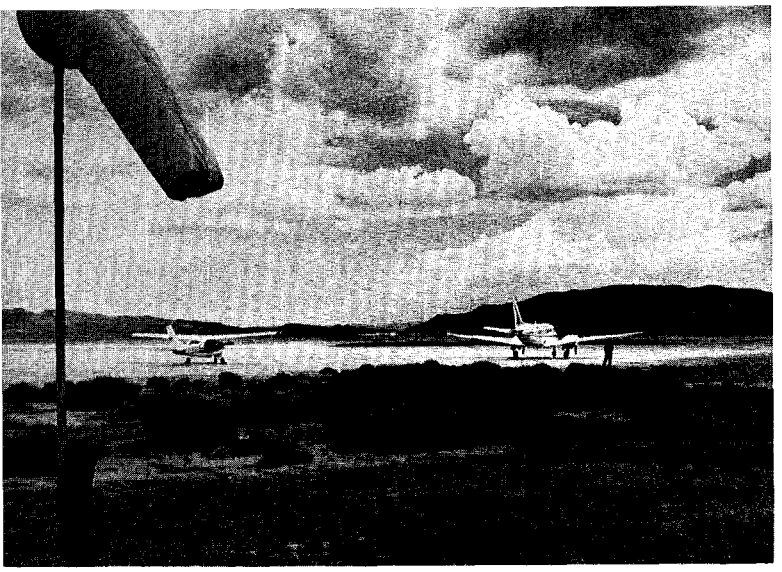
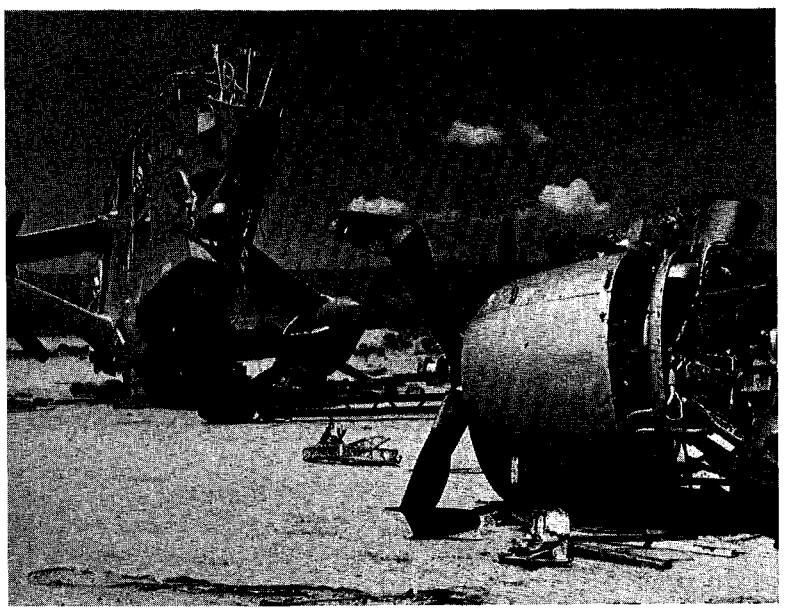
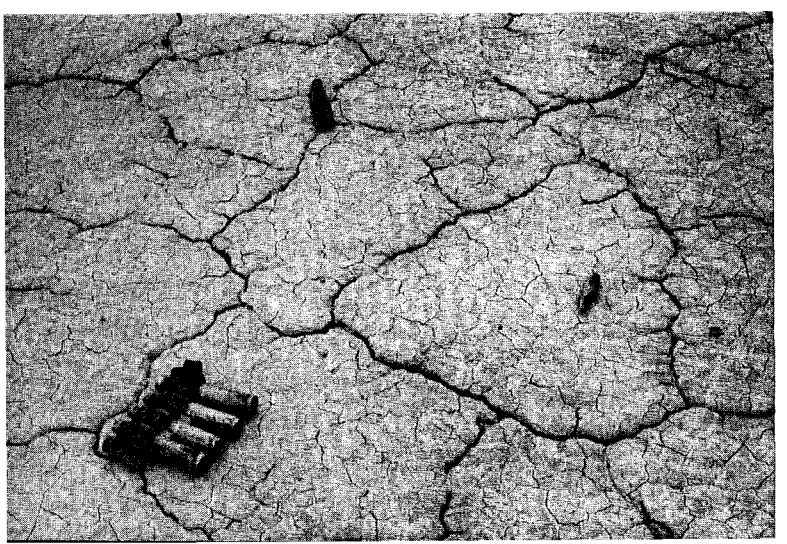


An airstrip on one edge of the lake serves a variety of uses for personnel and equipment.



ABOVE: A blimp gondola (left) and part of a P-47 airplane (right) are part of the "graveyard" on the edge of Yucca Lake. BELOW: Cartridge casings, slugs and clips litter the lake bed from the days when it was a gunnery range for aircraft.



Yucca Lake . . .

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and .50 calibre machine guns are uncovered from the dust by rain and lie exposed on the bed.

The AEC obtained the site shortly after World War II, so this metal has been lying on the lake for about 20 years. And yet, although there is some rust, the dry desert air has caused the casings and slugs to be remarkably well-preserved. Some visitors to the lake bed have gathered these artifacts of the Second World War and polished them for souvenirs.

On the northern edge of Yucca Lake is a small "graveyard" for airplanes and blimps of World War II vintage. The planes—P-47 fighters—and U.S. Navy blimps were flown into the test site for effects tests of nuclear weapons in the 1950's. After the tests, the remains of the planes and blimps were stored on the edge of Yucca Lake.

The names of the pilot and plane captain are still legible on either side of one of the blimp gondolas, and it is possible to climb inside the gondola and sit where the crew did. Likewise, certain instructions for maintenance still show faintly on the fuselages of some of the planes. A small piece of metal, salvaged from the wreckage recently, had a label attached which reads: "Made by Idiot Electronics, Inc., Yuk Yuk Flats, Nevada."

One World War II aircraft brought in for effects testing suffered a better fate than the blimps or P-47s. This was a B-17, the "Yucca Lady," which was used in the first series of tests in 1951-'52 and was sold as scrap in 1965. However, the man who bought her fixed her up and a few months later flew the "Yucca Lady" off the lake bed for a future of fighting forest fires.

An 11,000-foot airstrip, featuring its own one-room waiting area, lies on the eastern edge of Yucca Lake. The strip is used to fly in personnel, critically-needed parts and supplies and other items for the forward areas.

Also on the eastern edge is a rock formation known locally as "News Knob." A series of wooden benches remain from the time when members of the news media were permitted on the site to observe above-ground tests. Today a number of trailers housing supporting facilities are parked near "News Knob."

Because the lake bed is flat and smooth (in most places), it is used as a shortcut by some people to cross to the other side. The cars and trucks kick up a fine trail of dust in their wake as they cross—with the driver keeping a wary eye open for obstacles such as ditches and holes in the lake bed.

It's true that you can't go swimming in Yucca Lake . . . but it's not quite a barren "nothingness."

Anchor Bunker: Refuge for a Crystal Maker

By BOB BRASHEAR

The exile of Anchor Bunker will soon be a first class member of Laboratory society once again.

Earl Fullman of LASL's J-16 group was banished 15 years ago because he played with fire—and all the laboratory buildings surrounding him were made of wood.

Earl's line of work, not the aura of chemicals which permeate the atmosphere when he is near, was the cause for his banishment. But he wasn't ordered into isolation because he was a cowardly chemist acutely aware of the pyrotechnic qualities of the materials he handled. Plastics, the all-pervading material of the modern day, brought the invitation for Earl literally to fold up his lab and disappear.

He moved into the old Anchor Bunker—a solid concrete building half buried in the earth and impervious to the fumes and fires of Fullman's alchemy. Plastics don't follow the rules laid down in books,

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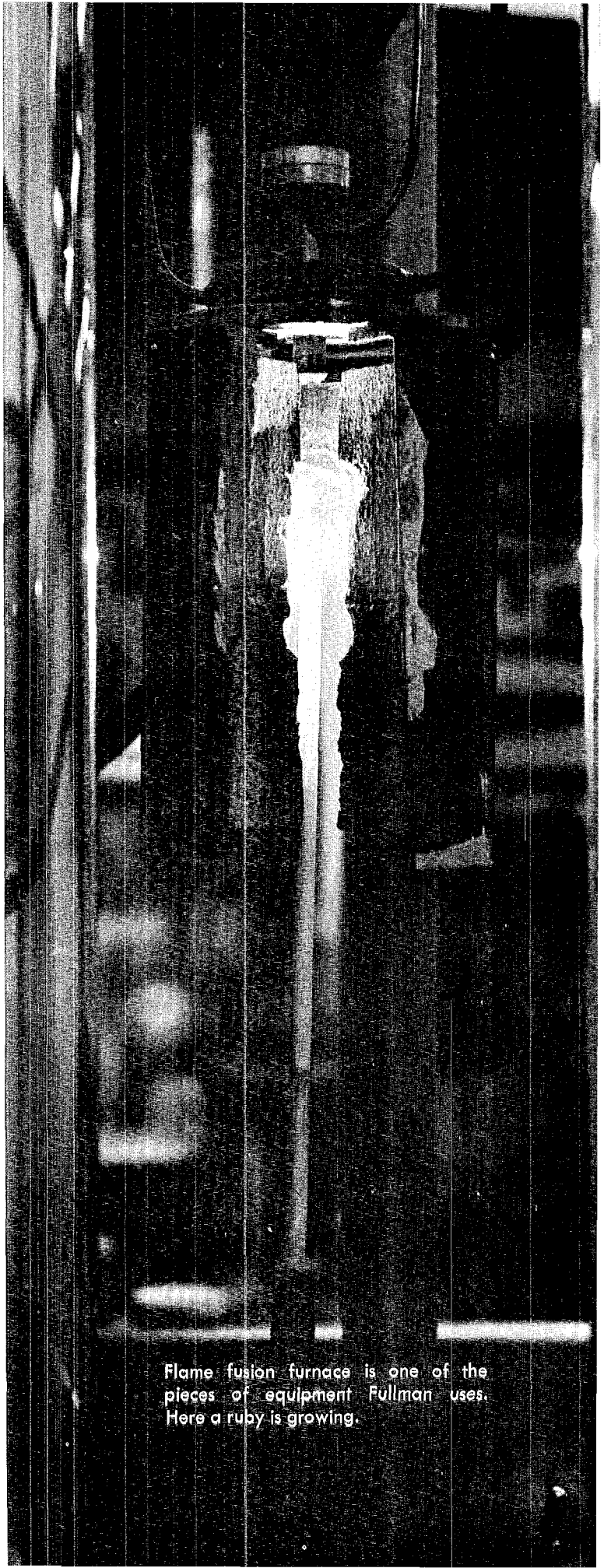
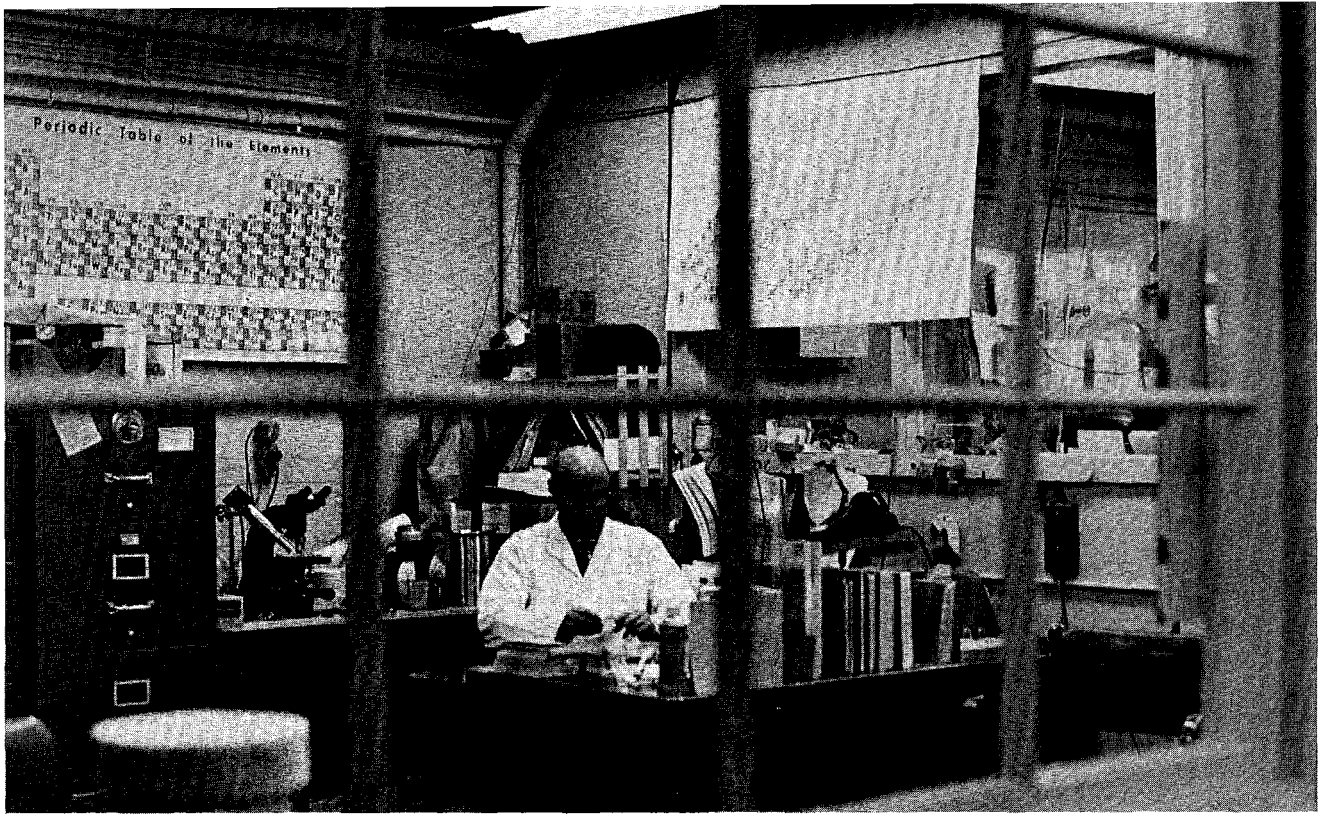


Flame fusion furnace is one of the pieces of equipment Fullman uses. Here a ruby is growing.



Fullman checks one of his plastics. He does much experimenting because the books are sometimes wrong, he says.

Anchor Bunker. . .

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despite what the vendors say, according to Earl. Many other materials follow somewhat the same pattern, so Earl works with his hands rather than from recipes.

Fullman's exile has been spent in one of LASL's truly historic spots—Anchor Bunker. The bunker itself was isolated from the original Laboratory site, which was near Ashley Pond, because explosives tests and experimental projectile tests with cannons were directed from it.

Built for use of Navy personnel in 1943, the bunker was literally buried under six feet of earth, its walls and roof heavily reinforced to withstand all types of explosive shock. Experimenters could peer through a periscope from the control room inside into two explosives test areas.

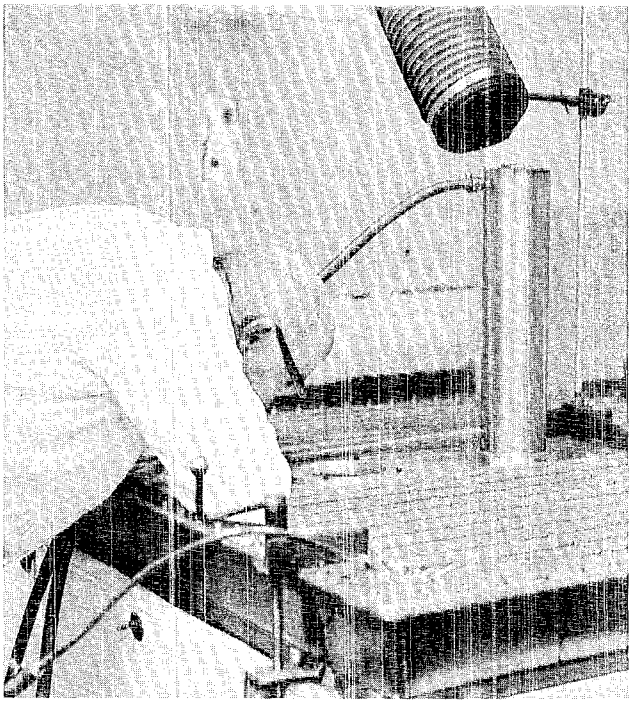
The then Navy Capt. William G. Parsons—the man who armed the bomb dropped on Hiroshima—was in command of the tests. Ordnance work was the main reason for establishing the bunker out in the Anchor Ranch area near S site. The old Anchor Ranch headquarters building, not far away, was being used as headquarters for security guards. When tests were run, the guards took shelter in a special room in the bunker. Some of the developmental work on Fat Man—second LASL atom bomb to be used in World War II—was also done at the bunker.

When Fullman moves into the new J division building on South Mesa within the next two months, the old landmark—now surrounded with other laboratory buildings—is to be torn down.

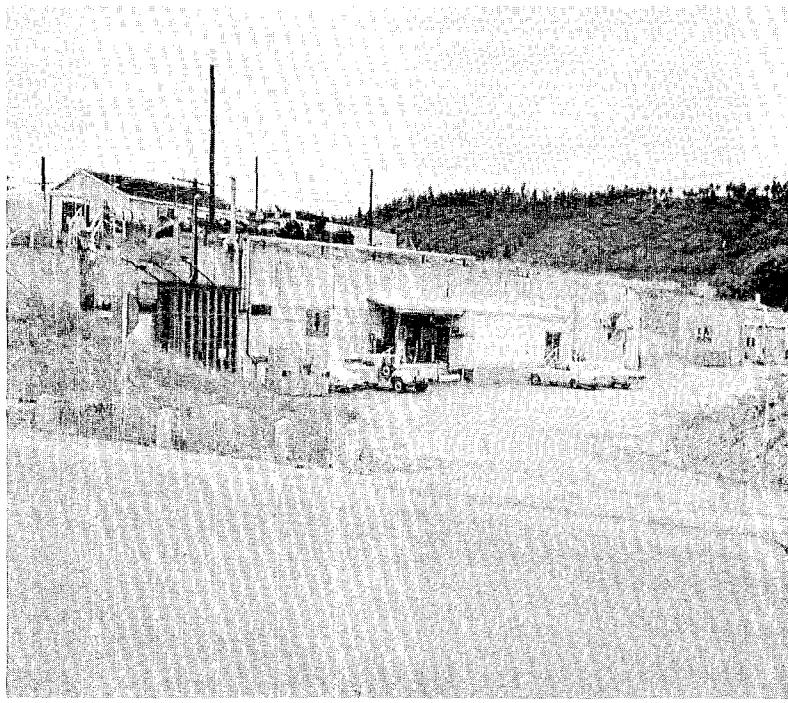
Fullman was hired in 1949 to grow crystals. He is a physical chemist, but had noted in the "hobby section" of his personnel sheet that he was interested in crystal work—"and that's where they had put me."

That's where Earl still is today. "Everybody wants our product—but nobody wants us," he says. It's notable that when Earl puts his feet up on his desk to reminisce, his audience can see his tennis shoes. "I'm ready to run at any time. Call me a cowardly chemist if you will, but I'm still here to work after all these years—and we've only set the place on fire once."

The first assignment Earl received was to grow crystals of napthalene—moth balls for use as scintillators to replace ion chambers which reacted to radiation a little more slowly. The big firms were charging four dollars a gram for crystals, Earl recalls. "I grew some 400-pound crystals for LASL at 25 cents a pound. On the commercial market they would have cost $728,800. We were turning one out every three days. Then the liquid scintillators—liquids which react to the passage of radioactive particles through them—came along and put the napthalene out of business."



Fullman watches through port as plastic scintillators form. Plastic is boiled, then solidified. "I keep my track shoes handy," he says.



ABOVE: Old Anchor Bunker, used for experiments during Project Y days, is slated to be torn down after Fullman moves to new J division building. BELOW: Small bottle holds tiny germanium crystals shaped to make infrared detectors.

Transtilbene and sodium iodide crystals became popular as scintillators, Fullman said, "and we put them out by the bucketful."

It was when he started experimenting with other plastics which were slightly unstable that Earl was invited to move. Plastics, when they are curing, generate a heat of something like 178 calories per gram. If the surface of the material congeals too rapidly, the heat is retained inside, and builds up to an eruption something like a volcano. The vapors given off combine with oxygen to form explosive peroxides, and this reaction Fullman describes as "about like boiling gasoline."

The polystyrene plastics—still popular—were selling commercially for $500 a pound in the '50's. The Laboratory was engaged in testing nuclear weapons, and there was a requirement for about five tons a year. "We turned it out at $2.56 a pound. One crystal looked like a six-foot wall and weighed just under a ton."

Fullman is an experimentalist from the word go. "I found a long time ago that it is better to experiment under actual conditions of use rather than to rely on the books," he says.

On the side, while he was engaged in a rather heavy production schedule for plastics, Earl ex-

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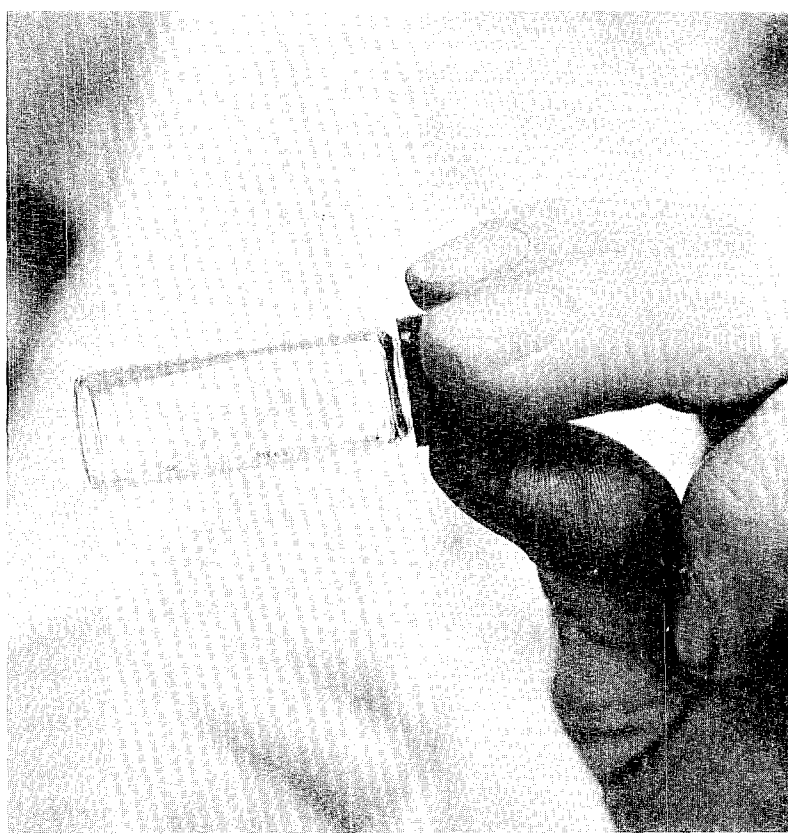

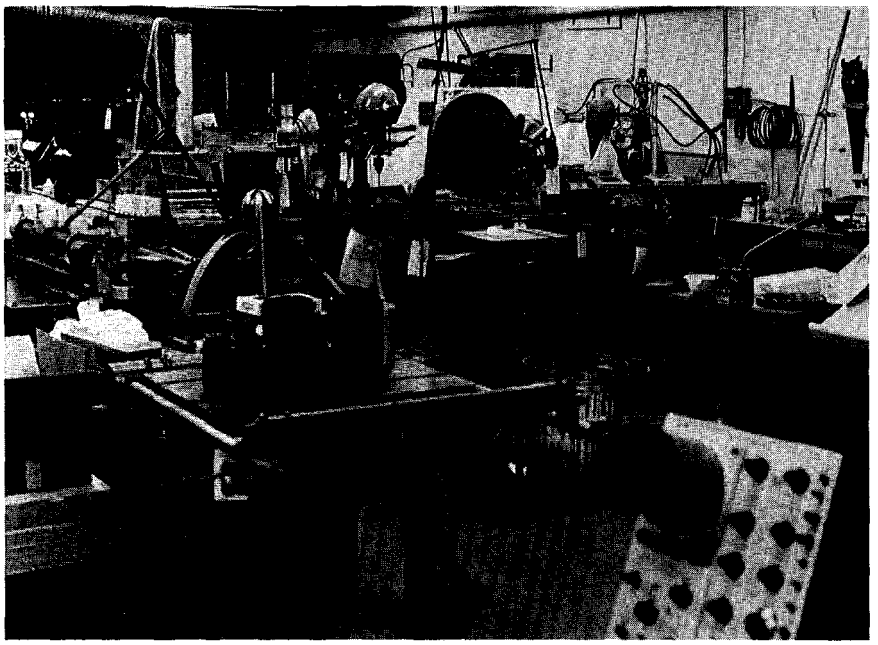

ABOVE: Equipment in already cluttered Anchor Bunker is pushed into one room in preparation to move to new J division building later this month. LEFT: Fullman places material in furnace to grow antimony crystals.

Anchor Bunker . . .

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perimented with growing other crystals. He's received help over the years from two people, Benny Martinez and Mrs. Bruce Riebe—and they wear tennis shoes, *too.*

"Any time someone gets an idea for the use of a crystal in his work, he looks us up; so we've tried crystals of just about every material known," says Fullman. "We haven't always been successful, but we've discovered a lot about them that isn't in print."

On his own or at the request of other researchers, Fullman has, through the years, delved into things like making rubies—the proper word is "growing"—and diamonds; whiskers of iron so strong their tensile strength can only be estimated; the elemental materials; mineral and organic crystals, semi-conductors, or, as Earl puts it, "just about everything on the periodic chart. One large jar sitting atop a refrigerator has a label reading: "Hexamethylenetetramine." Earl's explanation: "A crystal I'm working on."

Earl's work area looks like a laboratory where one big experiment is going on all the time. Apparatus for cutting, sawing, shaping, heating, polishing, cooling is everywhere in considerable disarray. "We don't have to be neat," he says. "Nobody ever comes to see us."

Somehow, when Earl starts spouting off things like indium antimonide, cadmium sulfide—doped to give it different properties for infra-red, x ray and gamma ray detection—uranium oxide, the alkaline earth series, bromides, tellurides, selenides, thalium and gallium, and what he's done with them, the disarray takes on the shape of homemade tools and devices with which to gain knowledge for himself and for LASL.

Earl's eyes really glow and his excitement visibly mounts when he talks of rejoining lab society. His re-entry will come as soon as the new J division building is complete.

"I'll have equipment that will allow me to work in all heat ranges from room temperatures up to 3,000 degrees," he says. "I'll be able to grow things people haven't looked at yet, and find uses for them. I'll . . . . . ."

Somehow, you know he will, when his exile ends.

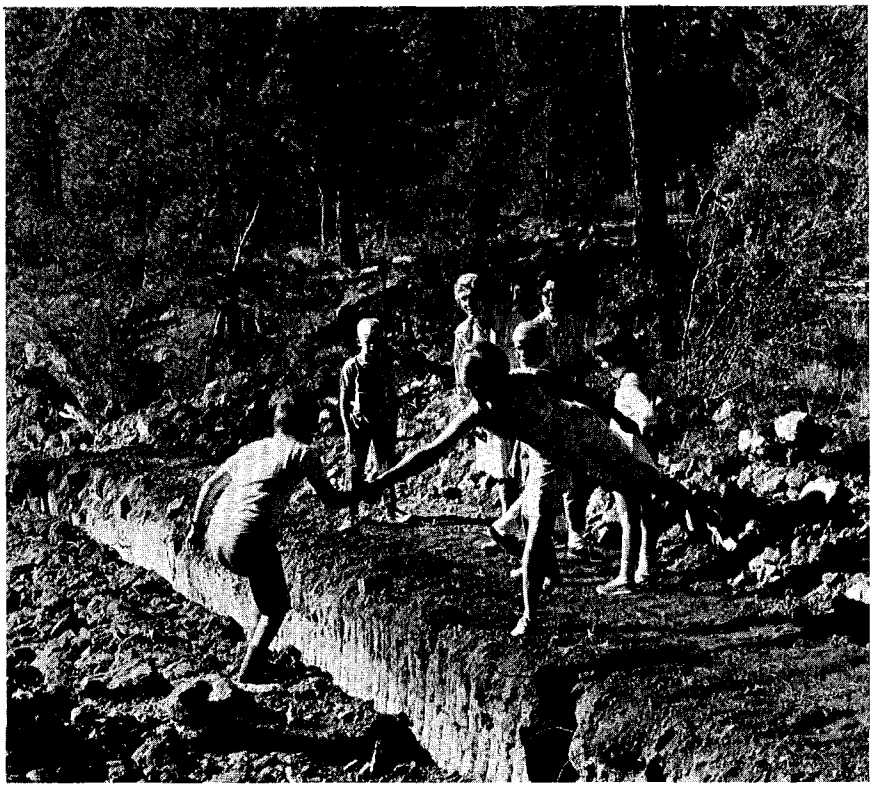
Quemazon Nature Trail— So Near, Yet So Far

Community Center, DP Site, South Mesa tech areas and, in the distance, the Sangre de Cristos, loom into view at one point on the Quemazon Nature Trail. Voice of a dispatcher in the Zia shops just below can be heard with startling clarity from the forest trail.

story on next page

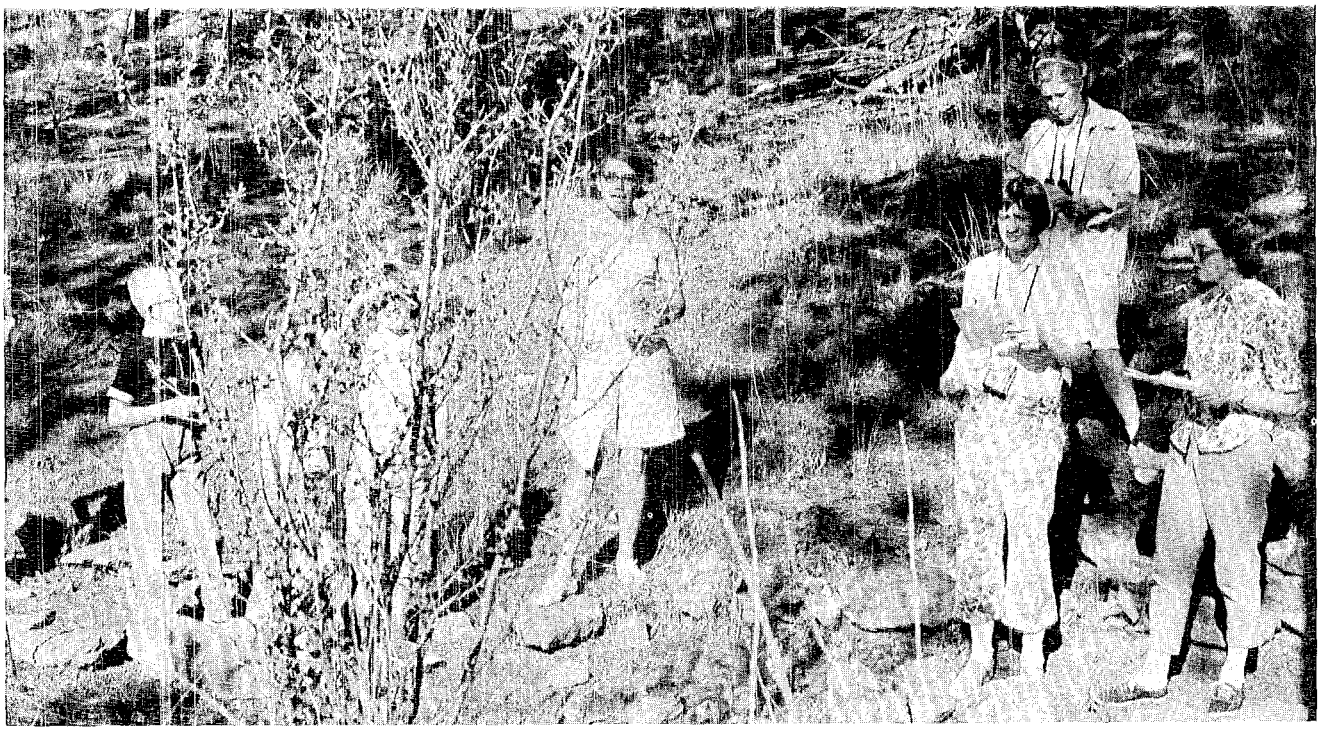
Trail is clearly marked with logs and stones, and numbered markers indicate common species of trees and other plants.

Susan Hall, who has been conducting nature trail tours for county recreation department this summer, helps David Tallman in flying leap across newly excavated gasline trench. David is the son of the Charles Tallmans (N-4).



WALK FIVE or 10 or 15 minutes from almost any place in Los Alamos—and you'll find yourself in forested wilderness that could just as well be hundreds of miles away. This is one factor that proved to be a saving grace for Los Alamos in the Project Y days of the early and middle forties when living conditions were primitive and the scientific goal highly complex and extremely urgent. Then, as now, Los Alamos scientists found a "walk in the woods" an excellent way to relax and forget the cares of their everyday world.

One of the most popular and easily accessible trails is the Quemazon Trail which begins directly behind the Western Area. The trail winds upward to meet the Pipeline Road at about the 8500 foot level



Susan Hall, center, points out mountain mahogany to hikers. From left are Russell Jeffries, son of the Robert Jeffries, (GMX-7), Kathy and David Tallman, Mrs. William McCall (at rear), Julie Lenhart and Mrs. Barry Lenhart.

in an area that was used for logging operations before Los Alamos existed. In many sections of the Quemazon Trail, there are deep ruts that were cut into the tufa by steel-tired wagons hauling logs down the mountain.

A short, semi-circular section of the Quemazon Trail proper has been clearly marked by Los Alamos Boy Scouts. It provides a pleasant, leisurely walk, and, because of its proximity to town, has become a fine place for youngsters to explore. This section, now called the Quemazon Nature Trail, is approximately a mile and a half long and begins and ends near the water tanks in the Western Area.

During the summer, the Los Alamos County recreation department schedules "guided tours" through the nature trail each Tuesday and Thursday morning. This summer, Miss Susan Hall, daughter of Mr. and Mrs. Don Hall (Eng-2), is leading the tours. Arrangements must be made in advance by calling the county recreation department.

Twenty-two markers along the trail indicate many of the trees and shrubs native to the area, and mimeographed sheets listing the characteristics of each are a handy addition to the trip. These are provided for the guided tours and are also available from the recreation department for those who wish to follow the trail at other times.

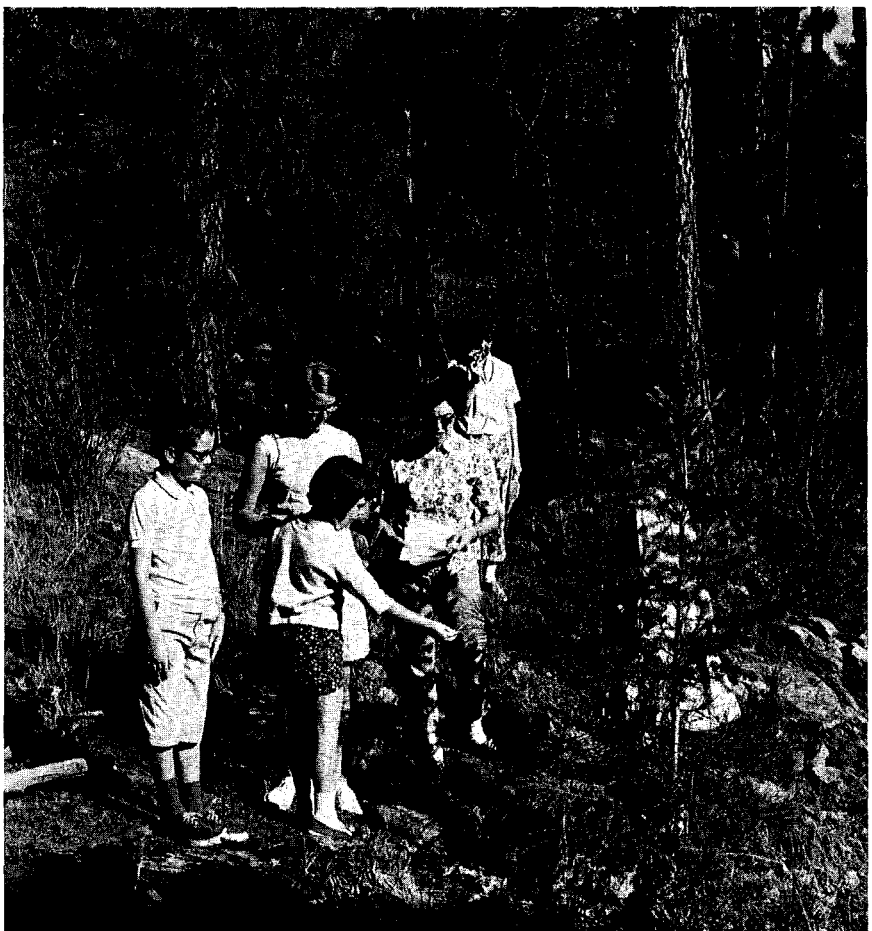
A rambling, but easy, uphill walk, the nature trail begins at the access road to the water tanks, just

continued on next page

Large stone markers give reassurance the hiker is still on the trail. Nature trail follows part of old Quemazon logging road used in the early '30s.

ABOVE: Mrs. William McCall makes down-to-earth inspection of brilliantly colored toadstool. LEFT: Ponderosa pine root seems better than man-made playground equipment. Tree probably blew down about 1930 when sawmill operators were harvesting mature timber in this area. At this point, the Quemazon trail joins another old logging road and turns west uphill to north rim of Los Alamos Canyon.

Differences in needles provide one clue in identifying trees, Susan Hall explains to David and Kathy Tallman, foreground, Mrs. Barry Lenhart and Julie Lenhart.



Quemazon Trail . . .

continued from preceding page

off Trinity Drive. It winds gradually upward, south and southwest to the rim of Los Alamos Canyon, then moves west and north on the north rim and returns over the original logging trail to the water tank area. Much of the path is continuously marked on both sides with logs. The remainder is clearly marked with stone monuments.

Once on the trail, the hiker seems surrounded by wilderness—but with an occasional glimpse of the South Mesa tech area far below. But the most abrupt reminder of how near civilization really is is the forested silence occasionally punctuated by the amplified voice of a telephone operator in the Zia Company shops

ABOVE: Deep ruts were cut into the tufa by wagons bringing logs down the mountain in the early '30's. BELOW: Horned toad was a special "find" for Craig Jeffries, eight-year-old son of the Robert Jeffries. Brother Russell Jeffries assisted.

below, calling someone to the telephone.

Most commonly seen wildlife are small lizards and horned toads, an abundance of birds, an occasional wild turkey and, depending on the season, Los Alamos's familiar mule deer. Ponderosa and limber pine, balsam and Douglas fir, Utah juniper, gambel oak and the familiar quaking aspen grow in abundance, as do mountain mahogany, wild rose, barberry and kinnikinnick—a red-berried ground cover relished by the turkeys.

Though the trail can be covered in much less time, it is most enjoyable as a leisurely two- or three-hour early evening or Sunday afternoon walk with frequent stops to enjoy the scenery and the surroundings.

short subjects

Four patents by Los Alamos Scientific Laboratory scientists are among 53 recently made available for public use by the Atomic Energy Commission.

Included are "Welding Jig" by **J. W. Woolsey** and **H. I. Bowers,** both K-3; "Prestressed Concrete Containment Vessel" by **D. W. Mueller,** MP-4; "Nuclear Reactor with Thermionic Converter" by **G. M. Grover,** N-5, J. Bohdansky of Tiano, Italy, and C. A. Busse of Laveno, Italy; and "Capillary Insert for Heat Tubes and Process for Manufacturing Such Inserts" by Grover, Busse and R. J. Caron of Ispra, Italy.

Frederick C. V. Worman, archeologist for Los Alamos Scientific Laboratory, has published a treatise, LA-3636, dealing with archeological salvage excavations on Mesita del Buey.

The mesa runs along the north side of Pajarito Road and is west of State Highway 4.

Worman, working to preserve historic knowledge in areas where laboratory work is carried on, directed excavation of several so-called "small-house" sites dating from approximately 1150 to 1300. Artifacts and architecture indicate that the first people on Pajarito Plateau were the Keres Indians migrating northward from the Little Colorado and Zuni-Acoma areas, he says in the treatise.

Worman is in charge of protecting prehistoric living sites and artifacts discovered both in the Los Alamos area and at the Nevada Test Site.

John A. Northrop, J-DO, has accepted an appointment as assistant to the chief scientist for effects tests, Defense Atomic Support Agency. He left earlier this month for Washington, D.C., for the new assignment, during which time he will be on leave of absence from LASL. DASA is a Department of Defense agency. Northrop, with LASL since October, 1951, worked in groups P-12 and P-4 before joining J-DO four years ago. He received his B.S. and Ph.D. degrees in physics from Yale University.

Paul R. Franke, budget officer of LASL since 1963, has joined the staff of MP division. In his new job, Franke will be concerned with the engineering planning of the experimental areas of the proposed meson physics facility. Franke received his B.S. degree in civil engineering from the University of Colorado in 1947 and spent seven years with the Engineering Department's planning and design group prior to his budget office assignment.

The Atomic Energy Commission's plant facilities management group met at LASL last month for discussions on facilities engineering, facilities requirements for the future and mutual problems of the AEC contractors.

The group is composed of employes of AEC prime contractors and are supervisory personnel who are primarily concerned with production or laboratory facilities. **Joseph B. Weldon,** ENG-2 group leader, was LASL coordinator for the meeting.

Among the speakers were **R. E. Schreiber,** technical associate director of LASL, who spoke on "Past Accomplishments and Future Goals of Los Alamos Scientific Laboratory." John Derry, director of the AEC's division of construction, also addressed the group on "AEC Plans and Future Programs."

In addition to the business sessions the estimated 20 attendees also toured LASL facilities and the Bandelier National Monument.

A Los Alamos Scientific Laboratory documentary movie, "Solar Eclipse Expedition—1966" produced by group D-10 has been accepted for showing at the 1967 Western Electronic Show and Convention (WESCON) Science Film Theater Aug. 22 through 25 in San Francisco.

The 32-minute color film describes the major experiments for the airborne observation of the total solar eclipse over the South Atlantic Nov. 12, 1966. LASL scientists are shown with their equipment in flight aboard the instrumented NC-135 flying laboratory which was based at Buenos Aires, Argentina.

Raymond N. Rogers, GMX-2 staff member, left this month for Tucson, Ariz., where he will spend a year's leave of absence from LASL working in the University of Arizona's chemistry department. While there he will also assist in setting up a new department of geochronology and will do research on organic chemical problems in that field. Rogers received his B.S. degree in chemistry from the University of Arizona and his M.S. degree in agricultural chemistry from the same institution. He has been with LASL since April, 1952.

The Atomic Energy Commission's General Advisory Committee met at the Los Alamos Scientific Laboratory Aug. 2-4.

Jane Hall, LASL assistant director, is a member of the GAC, which was established by the Atomic Energy Act of 1946. The nine civilian members are appointed by the President to advise the AEC on scientific and technical matters relating to materials, production and research and development.

In addition to a series of meetings, the GAC members toured various LASL facilities.

Homer Pickens, AEC conservation officer for Los Alamos, has taken over as coordinator for the Civil Defense Search and Rescue organization.

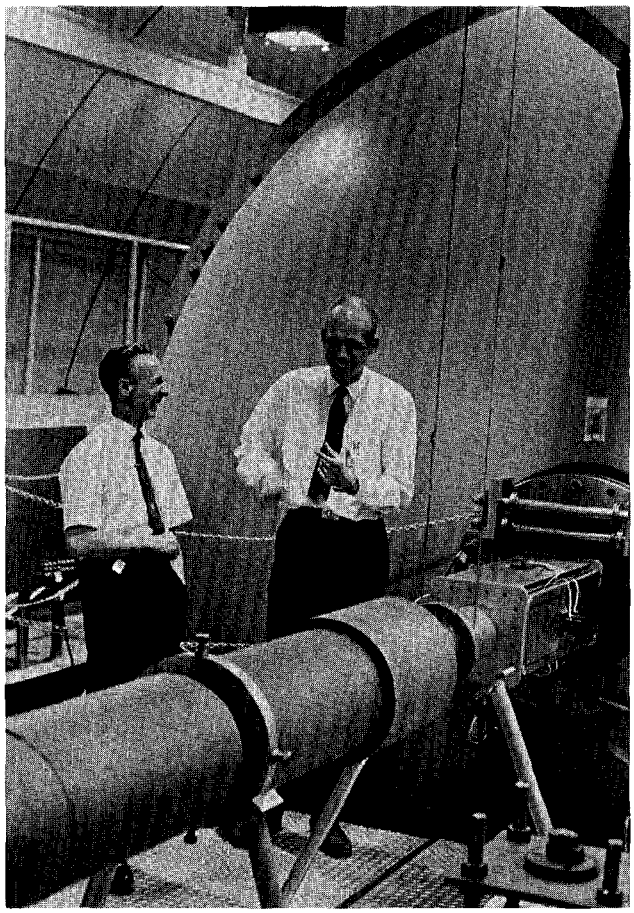
Pickens, long active in the CD program, replaces **Jesse T. Rose** in the key post. It is his job to coordinate activities of all organizations taking part in a search operation, to organize and obtain all search personnel and to set up a plan of operation, according to **Robert Y. Porton,** CD director.

Twenty-two Los Alamos organizations cooperate in the search and rescue group, including five Explorer Scout posts, all of which are capable of running the river and searching rough terrain. **George Jarvis** of Post 20 is coordinator for readiness training of the Explorer posts.

Search and rescue missions are set up only by request from the police after they have been notified that a person is missing.

John E. Hockett, a metallurgist in CMF-13, has been appointed a member of the transactions committee of the American Society for Metals. The appointment is effective Sept. 1 and is for a three-year period. The American Society for Metals has more than 30,000 members. Hockett came to LASL in 1952.

Raymond C. Mjolsness, T-12, left late last month for Pennsylvania State University, University Park, where he will spend the next year teaching in the astronomy department. Mjolsness, on leave of absence from LASL during this period, will teach both undergraduate and graduate-level courses in the field. A Laboratory staff member since 1963, Mjolsness received a B.A. degree in physics from Reed College, Portland, Ore.; a B.A. degree in mathematics from Oxford University, England; and a Ph.D. degree in mathematics and physics from Princeton University. He was a National Science Foundation predoctoral fellow and a Rhodes scholar.



Harold Sneddon Weeks, left, chief scientific advisor, Ministry of Defense, and officer in charge, Atomic Coordination Office, British defense staff, Washington, D.C., obviously enjoyed the discussion of PHERMEX capabilities with Donald Janney, GMX-11 alternate group leader. The British scientist recently toured Laboratory facilities. He was accompanied by Capt. John W. Fairbanks, USN, assistant director for plans and military cooperation, AEC division of military application, and Joel White, Albuquerque Operations Office United Kingdom coordinator, division of special activities.

The Technical Side

Presentation at the Combined Physics-Chemistry Seminar at the University of Wyoming, Laramie, Wyo., May 2:

"Proton Exchange in the Water Molecule" by S. W. Rabideau, CMF-2 (Invited lecture)

Presentation at "Education Day" meeting of Detroit Section of the American Chemical Society, Detroit, Mich., May 16:

"Toy Explosives' by R. N. Rogers, GMX-2

Du Pont Thermal Methods Conference, Wilmington, Del., May 23:

"Thermal Studies of the Physical Chemistry of Explosives' by R. N. Rogers, GMX-2

Marine Technology Society Meeting, San Diego, Calif., June 1:

"A Deep Ocean Surface Wave Measuring Buoy System" by A. R. Metzler, Interstate Electronics Corps., and K. H. Olsen, J-15

Presentation at the Joint Institute for Nuclear Research, Dubna, U.S.S.R., June 5:

"Nuclear Physics Program at Los Alamos" by R. F. Taschek, P-DO (Invited talk)

International Atomic Energy Agency International Symposium on Instruments and Techniques for the Assessment of Airborne Radioactivity in Nuclear Operations, Vienna, Austria, July 3-7:

"Characteristics of the Radioactive Pollutant from Ground Testing of Nuclear Propulsion Reactors" by R. W. Henderson, H-8

Presentation at Institut Rudder Boskovic, Zagreb, Yugoslavia, July 7:

"Research at Los Alamos" by John D. Seagrave, P-DOR (Invited talk)

1967 Institute of Electrical and Electronics Engineers Conference on Nuclear and Space Radiation Effects, Columbus, Ohio, July 10:

"Transient Radiation Effects in Optical Materials" by P. N. Mace, J-8

Presentation at Massachusetts Institute of Technology, Cambridge, Mass., July 10:

"NET-2 Circuit Analysis Program" by A. F. Malmberg, T-7

"An Algorith for the Integration Sequence of a Set of Simultaneous Differential Equations" by A. F. Malmberg, T-7

X Ray Effects Conference sponsored by Defense Atomic Support Agency, Battelle Memorial Institute, Columbus, Ohio, July 11-13:

"Elastic—Plastic Free-Surface Studies" by J. W. Taylor, GMX-6 (Classified conference)

Presentation at Sandia Corp., Albuquerque, N.M., July 12:

"Airborne Solar Eclipse Observations" by A. N. Cox, J-15

Second International Symposium on Nucleonics in Aerospace, Columbus, Ohio, July 12-14:

"An Intense Source of Neutrons from the Dense Plasma Focus" by J. W. Mather, P-7 (Invited talk)

"Measurement of the Surface Distribution of Carbon and Oxygen by ^{3}He Activation and Autoradiography" by D. M. Holm, K-1; W. M. Sanders, K-1; W. L. Brisco, P-1; and J. L. Parker, K-1

Conference on Computer Animation, Newton, Mass., July 17-18:

"Field Problems, Display of Time-Varying Continuum Method of Representation" by J. P. Shannon, T-3 (Invited talk)

American Institute of Aeronautics and Astronautics Third Propulsion Joint Specialist Conference, Washington, D.C., July 17-21:

"A Look at Nuclear Thermionics Systems" by R. E. Schreiber, Dir. Off., and E. A. Salmi, N-5

"Cooldown of Cryogenic Transfer Systems" by D. H. Liebenberg, J. K. Novak and F. J. Edeskuty, all CMF-9

"Status of the Phoebus Program" by R. W. Spence, N-DO

Roser, Campbell Earn Citations For Transfer Activities

Herman E. Roser, manager of the Los Alamos Area Office of the Atomic Energy Commission, and Charles C. Campbell, former area manager and now assistant manager for administration at the Albuquerque Operations Office, have received special citations for their efforts related to the termination of federal ownership and management of the Los Alamos community.

Roser was cited for his "untiring and dedicated efforts in developing and carrying out the detailed AEC plan for the termination of the government's ownership and control of the Los Alamos, New Mexico, community. Through his efforts, the major phases of the complex plan were developed and implemented on schedule. The difficult task of reconciling private and public interests—federal, state and local—was accomplished with no adverse effect on the Los Alamos community. During this period, Mr. Roser assumed added duties and responsibilities which led to his subsequent appointments as deputy area manager and manager of the Los Alamos Area Office. The outstanding manner in which Mr. Roser carried out his responsibilities, characterized by an unparalleled devotion to duty, was a major factor in the timely completion of this major Commission undertaking."

Campbell's citation reads, in part, "Under Mr. Campbell's outstanding leadership and initiative, and his ability to inspire public confidence, this under taking was accomplished smoothly and efficiently. Mr. Campbell's contribution to this major Commission program reflects great credit on himself and the Atomic Energy Commission."

new hires

Accounting Department

Dorothy F. Gill, Los Alamos, AO-1
Ethel J. Richmond, Los Alamos, AO-7

CMB Division

Homer G. Moore, Oak Ridge, Tenn., CMB-11
Robert F. Velkinburg, Klamath Falls, Ore., CMB-14

Engineering Department

Beverly R. Hults, Los Alamos, ENG-5 (Casual)
E. Earline McKee, Los Alamos, ENG-5 (Casual)

GMX Division

James C. King, Albuquerque, GMX-6
Howard L. Walker, Amarillo, Texas, GMX-8

H Division

William F. Zapisek, Oak Ridge, Tenn., H-4
Russell B. Buchanan, Jr., Sandia Base, N.M., H-8

J Division

William Y. Endow, San Diego, Calif., J-5
Robert L. Tanner, Albuquerque, J-9
James E. Lambert, Albuquerque, J-9
Charles E. Cummings, Albuquerque, J-9
Paula D. Tubb, Los Alamos, J-11

MP Division

Kathryn H. Osborne, Los Alamos, MP-DO (Casual)
Thomas G. Van Vessem, Boston, Mass., MP-AE
Charles E. Woodard, Las Vegas, Nev., MP-2
Harold D. Ferguson, Albuquerque, MP-2(AE)
John W. Radcliffe, Spokane, Wash., MP-2
Stephen D. Palermo, Upton, N.Y., MP-3(AE)

Mail and Records

Xavier Lovato, Albuquerque, MP-1

N Division

Roddy B. Walton, San Diego, Calif., N-6
Alan C. Berick, Los Angeles, Calif., N-6

P Division

Alcario R. Marquez, Santa Fe, P-1
David Brown, Geneva, Switzerland, P-1
Louis J. Morrison, Irvington, N.Y., P-2
Robert E. MacFarlane, Pittsburgh, Pa., P-2.
James T. Murphy, Klamath Falls, Ore., P-7
David M. Weldon, Berkeley, Calif., P-15

Personnel Department

Lucretia M. Henson, Los Alamos, PER-1 (Casual)
Clara F. Patterson, Los Alamos, PER-1 (Casual)
Colleen F. Gardner, Los Alamos, PER-7

Public Relations

Sharon E. Wilcox, Buffalo, N.Y., PUB-2 (Casual)

Shops Department

John G. Shook, Lawrence, Kans., SD-DO
Robert I. Hill, Mt. Vernon, Ohio, SD-1

T Division

Mary K. Thomas, Los Alamos, T-DO (Casual)
George W. Rice, Ponca City, Okla., T-13

Four Laboratory Employes Retire in July

Four Los Alamos Scientific Laboratory employes retired during July.

THELMA D. ALVORD, CMF-13 secretary, retired July 31. She started work with LASL in CMR-AP in 1954 and transferred to CMF-13 in June, 1956. A native of Indianapolis, she served in the Women's Army Corps from 1942 to 1945, primarily in recruiting service in New Mexico and the Southwest. Upon discharge, she managed the Sagebrush Inn in Taos for a time and came to Los Alamos in 1952, working for the Zia Company and the now-defunct Civic Club prior to coming to work for LASL. She plans to remain in Los Alamos following her retirement.

CARL HOLTOM, GMX-4 staff member, also retired July 31. He joined that group in July, 1954, coming here from the U.S. Air Force Institute of Technology, Dayton, Ohio, where he had spent six years. Born in Republic City, Kans., he received his A.B. and M.A. degrees in physics and mathematics from the University of Nebraska, Lincoln, and his Ph.D. degree in applied mathematics and mathematical astronomy from the University of Chicago. He taught mathematics at Purdue University for 17 years. He also taught applied mathematics courses at the Ohio State Graduate Center while at the Air Force Institute, and at the Los Alamos Graduate Center since moving to Los Alamos. He and his wife, Mabel, will leave Los Alamos in September to make their future home in Scottsdale, Ariz.

HERBERT CARL LAUF, branch shop foreman in SD-5, retired July 21. Born in Eden, N.Y., he joined SD-1 in June, 1951, as an industrial toolmaker, coming to LASL from the Crane Company of Chicago, where he had worked for 15 years. Lauf and his wife, Kathryn, are undecided whether they will continue to live in Los Alamos.

BERT F. SCHNAP, H-6 staff member, retired July 31. He joined LASL in November, 1945, in A division, the forerunner of H division. He transferred to CMR-12 a year later, and in 1951 joined group H-6, where he has been working since. He attended the University of Vienna, where he did both his undergraduate and some graduate work in biochemistry. He also attended the University of Minnesota, where he did additional graduate work in the field. Schnap served in the U.S. Army for three years from 1942 to 1945. He is a member of the American Chemical Society. Schnap said his plans following retirement are indefinite.

20 years ago in los alamos

Culled from the files of Los Alamos Times, August, 1947, by Robert Y. Porton

Fast Reactor Developed Here

Successful operation of a new type chain reaction plant or "pile" utilizing high energy neutrons for atomic fission of plutonium was announced here by Dr. Norris E. Bradbury, director of the Laboratory. The new reactor, known as a "fast reactor" because it uses fast neutrons to maintain the fission chain, has been operated successfully at low power since last November. The new unit, in a sense, is a controlled version of the atomic bomb itself. However, it is the first to employ the fission of the man-made element, plutonium, instead of normal uranium, and it is the first to use fast neutrons. The new reactor is expected to speed and broaden atomic energy research and is viewed by scientists as a valuable guide in the design of future experimental reactors for power.

Three Boys Confess to Vandalism

Three small boys of the community whom an FBI agent called "just kids—and I mean really just kids," confessed Wednesday to acts of property damage and destruction at the Project which amounted to approximately $2,000.

Agents, working with the office of the provost marshal, ran the youthful vandals to ground.

The riot of mischief was perpetrated last weekend in part of the Western housing area and at Mesa Elementary School. At Mesa School they broke 104 window panes, overturned cans of paint and upset three partially full 55-gallon drums of kerosene.

The parents of the boys will have an opportunity to make ample restitution for the damage.

Wrong Way

A private flyer was a little bit confused yesterday afternoon in an attempt to fly from Amarillo to Albuquerque. He lost his bearings and landed on the Los Alamos landing strip. He carefully explained that his radio was out, he was lost and he was out of gas. When he saw the strip it looked like a logical place to set his new plane down.

Security rushed him to Santa Fe for gasoline, filled up his plane and literally pushed him off the Hill.

"This is a blacked-out area on the maps," William A. King, security officer, explained, "and it is not only illegal to land here but it is against the law to even fly over the Project."

what's doing

FILM SOCIETY: Civic Auditorium. Admission by single ticket, 90 cents, or season ticket, $4.

Wednesday, Aug. 16, 7 and 9 p.m.,

A Program of Short Subjects. Includes World Without End, Surprise Boogie, Music From Oil Drums, Sailing, The Squeeze and The Critic.

MESA PUBLIC LIBRARY EXHIBITS:

Art Exhibit: July 31—Aug. 28—Southwest Landscapes, Santos and Serigraphs by Louie Ewing, Santa Fe.

Case Exhibit: Aug. 1-Aug. 31—Los Alamos County Fir.

PUBLIC SWIMMING: Los Alamos High School pool. Adults, 50 cents; students, 25 cents.

Monday through Friday, Noon to 10 p.m.
Saturday and Sunday, 1 to 6 p.m.
Sunday, 7 to 9 p.m. Adults only.

OUTDOOR ASSOCIATION: No charge; open to the public. Contact leader for information about specific hikes.

Saturday, Aug. 12, contact Terry Gibbs, leader, for hike information, 8-4909.
Saturday, Aug. 26, San Pedro Parks Wilderness Area, Ken Ewing, leader, 8-4488.
Thursday, Sept. 7, Meeting—time and place to be announced.

SPORTS CAR CLUB del Valle Rio Grande:

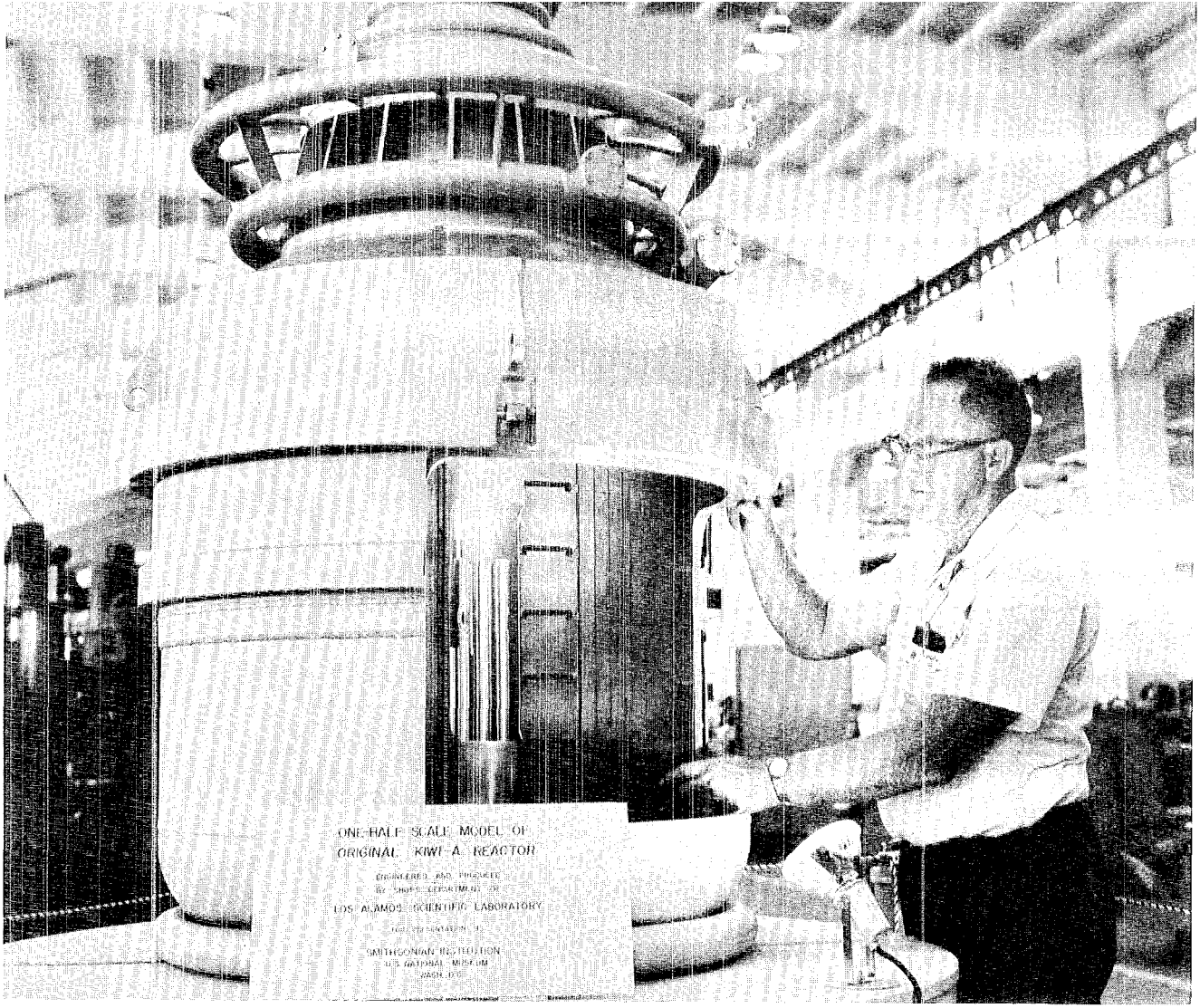
Concourse in conjunction with Los Alamos County Fair, Aug. 26.

SANTA FE THEATRE COMPANY: performing in the Greer Garson Theatre, Santa Fe. Premier season, June 14-Sept. 3. Performances Wednesday through Sundays.

For information call 982-6511.
Aug. 9-20—"The Subject was Roses"
Aug. 23-Sept. 3—"Born Yesterday"

SANTA FE OPERA: Tickets available at Los Alamos Building & Loan, Mondays, Wednesdays and Fridays from 10 a.m. to 1 p.m. Curtain time 9 p.m. All performances for the remainder of the season will be at Sweeney Gymnasium, corner of W. Marcy and Grant Sts., Santa Fe.

Wednesday, Aug. 9—"Carmen."
Friday, Aug. 11—"The Marriage of Figaro."
Saturday, Aug. 12—"La Boheme."
Wednesday, Aug. 16—"The Marriage of Figaro."
Thursday, Aug. 17—"Carmen."
Friday, Aug. 18—"Salome."
Saturday, Aug. 19—"The Marriage of Figaro."
Wednesday, Aug. 23—"Salome."
Thursday, Aug. 24—"Carmen."
Fri., Aug. 25—"The Barber of Seville."
Saturday, Aug. 26—"La Boheme."



A cutaway half-scale model of the first nuclear reactor in Project Rover, LASL's Kiwi A, will soon be on exhibit at the Smithsonian Institution, Washington, D.C. Built by personnel of the LASL shops department under the direction of Merle Carter, above, the model will be on permanent display at the Smithsonian as a gift of the Laboratory. Carter and Robert Krohn, D-6, will assemble and install the model at the Smithsonian in early September.

BACK COVER:

Yes, Bill Regan, there IS a natural arch in Los Alamos . . . A story by Bill Regan, PUB-1, in the June ATOM described his misguided attempt to find a large rock forming a natural arch near the North Community. He concluded—mistakenly, he soon found out—that the arch didn't exist, or at least wasn't easily accessible. After the hecklers came the veteran hikers willing to lead the way. One of these was Bob Skaggs, N-5; but by the time his note arrived, Regan was on vacation. So PUB's Bill Jack Rodgers and daughter joined Skaggs and a group of neighborhood children - and proved, with photographic evidence, that the arch exists and does, indeed, frame a spectacular view of Los Alamos. Skaggs' instructions to Regan: "From the same stump you started at before, proceed up the same trail at a medium pace for exactly 20 minutes. At this time you will see immediately on your right and high above you a large rock nose or outcropping of hard tuff. That is the top of the arch. With 10 minutes of good rock scrambling, you can be there."

Henry T. Motz
3187 Woodland
Los Alamos, New Mexico 87544